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IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS

JUDGE GRADY

05C 4663

ILLINOIS TOOL WORKS, INC. )  
a Delaware corporation, )  
 )  
Plaintiff, )  
 )  
v. )  
 )  
A+ PRODUCTS, INC. )  
a New York corporation, )  
 )  
Defendant. )  
 )  
 )

Civil Action No. **MAGISTRATE JUDGE SCHENKIER**  
TRIAL BY JURY DEMANDED

**FILED**

AUG 15 2005 <sup>10</sup>  
AUG 15 2005  
MICHAEL W. DOBBINS  
CLERK, U.S. DISTRICT COURT

**COMPLAINT**

Plaintiff, Illinois Tool Works, Inc. (hereinafter "ITW"), for its complaint against defendant, alleges as follows:

**INTRODUCTION**

1. This is an action for infringement of United States Letters Patent Nos. 5,222,279 ('279 patent) (attached as Exhibit A); 5,926,928 ('928 patent) (attached as Exhibit B); D402,589 ('589 patent) (attached as Exhibit C); D397,641 ('641 patent) (attached as Exhibit D); D355,147 ('147 patent) (attached as Exhibit E); and D343,570 ('570 patent) (attached as Exhibit F) (collectively referred to as "the asserted patents"), which arises under the patent laws of the United States. ITW seeks: permanent injunctive relief; past damages for its lost profits caused by Defendant's infringement and unlawful use and practice of the invention(s) disclosed and claimed in and by the asserted patents (including any price erosion, convoyed sales, etc.) and/or as appropriate, at a minimum, a reasonable royalty for all of the Defendant's sales of its

infringing products; all other damages sustained by ITW as a result of said infringement; and, all costs and fees, including reasonable attorneys' fees, incurred by ITW in this action.

### **THE PARTIES**

2. Plaintiff, Illinois Tool Works, Inc. ("ITW"), is a Delaware corporation having its principal place of business at 3600 West Lake Avenue, Glenview, Illinois 60025. ITW designs, develops, manufactures and markets, among other things, fasteners and components, equipment and consumable systems, and specialty products and equipment.

3. A+ Products, Inc. ("A+") is, upon information and belief, a New York corporation having its principal place of business at 8 Timber Lane, Marlboro, New Jersey 07746.

### **JURISDICTION AND VENUE**

4. Subject matter jurisdiction of the Court is conferred by 28 U.S.C. §1338(a) as arising under title 35 U.S.C. § 1 et. seq., relating to patents. Jurisdiction also arises pursuant to 28 U.S.C. §1332 (a), the matter in controversy exceeding \$75,000.00 exclusive of interest and costs, and being between citizens of different states. Venue is established under 28 U.S.C. §1391 and 28 U.S.C. § 1400(b).

5. Upon information and belief, a reasonable opportunity for discovery will show that A+ has conducted business in this judicial district and/or has committed acts of infringement within this judicial district.

### **COUNT I – INFRINGEMENT OF U.S. PATENT NO. 5,222,279**

6. On June 29, 1994, U.S. Patent No. 5,222,279 ('279 patent) disclosing and claiming an invention entitled "Buckle Having Increased Holding Power When Under Load" was duly and legally issued in the names of Francis G. Frano and Steven C. Keller.

7. The '279 patent was assigned to ITW.

8. By virtue of its ownership of the '279 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '279 patent and to collect all damages for past infringement.

9. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '279 patent.

10. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '279 patent, in violation of ITW's rights thereunder.

11. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '279 patent, constituted and, continues to constitute infringement of at least one claim of the '279 patent, as provided in 35 U.S.C. § 271.

12. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

#### **COUNT II – INFRINGEMENT OF U.S. PATENT NO. 5,926,928**

13. On July 27, 1999, U.S. Patent No. 5,926,928 ('928 patent) disclosing and claiming an invention entitled "Vented Side Release Buckle" was duly and legally issued in the names of Kurt H. Lundstedt.

14. The '928 patent was assigned to ITW.

15. By virtue of its ownership of the '928 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '928 patent and to collect all damages for past infringement.

16. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '928 patent.

17. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '928 patent, in violation of ITW's rights thereunder.

18. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '928 patent, constituted and, continues to constitute infringement of at least one claim of the '928 patent, as provided in 35 U.S.C. § 271.

19. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

### **COUNT III – INFRINGEMENT OF U.S. PATENT NO. DES. 402,589**

20. On December 15, 1998, U.S. Patent No. Des. 402,589 ('589 patent) disclosing and claiming an invention entitled "Buckle Member" was duly and legally issued in the name of Kurt H. Lundstedt.

21. The '589 patent was assigned to ITW.

22. By virtue of its ownership of the '589 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '589 patent and to collect all damages for past infringement.

23. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '589 patent.

24. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '589 patent, in violation of ITW's rights thereunder.

25. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '589 patent, constituted and, continues to constitute infringement of at least one claim of the '589 patent, as provided in 35 U.S.C. § 271.

26. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

#### **COUNT IV – INFRINGEMENT OF U.S. PATENT NO. DES. 397,541**

27. On September 1, 1998, U.S. Patent No. Des. 397,641 ('641 patent) disclosing and claiming an invention entitled "Attachment Arms Of A Slide Release Buckle" was duly and legally issued in the names of Jeffrey R. Hamilton and Steven C. Keller.

28. The '641 patent was assigned to ITW.

29. By virtue of its ownership of the '641 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '641 patent and to collect all damages for past infringement.

30. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '641 patent.

31. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '641 patent, in violation of ITW's rights thereunder.

32. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '641 patent, constituted and, continues to constitute infringement of at least one claim of the '641 patent, as provided in 35 U.S.C. § 271.

33. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

**COUNT V – INFRINGEMENT OF U.S. PATENT NO. DES. 355, 147**

34. On February 7, 1995, U.S. Patent No. Des. 355,147 ('147 patent) disclosing and claiming an invention entitled "Zipper Pull" was duly and legally issued in the names of Franco G. Frano.

35. The '147 patent was assigned to ITW.

36. By virtue of its ownership of the '147 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '147 patent and to collect all damages for past infringement.

37. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '147 patent.

38. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '147 patent, in violation of ITW's rights thereunder.

39. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '147 patent, constituted and, continues to constitute infringement of at least one claim of the '147 patent, as provided in 35 U.S.C. § 271.

40. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

#### **COUNT VI – INFRINGEMENT OF U.S. PATENT NO. DES. 343,570**

41. On January 25, 1994, U.S. Patent No. Des. 343,570 ('570 patent) disclosing and claiming an invention entitled "Cord Lock" was duly and legally issued in the names of Terrence P. Meier.

42. The '570 patent was assigned to ITW.

43. By virtue of its ownership of the '570 patent, ITW has the right to exclude all others from making, using, selling or offering to sell, the embodiments of the inventions claimed in the '570 patent and to collect all damages for past infringement.

44. ITW manufactures, markets, and sells buckles as disclosed and claimed in the '570 patent.

45. Upon information and belief, A+ manufactured, and continues to manufacture, and sold, and continues to sell, products which contain, embody, and employ the invention(s) described and claimed in the '570 patent, in violation of ITW's rights thereunder.

46. A+'s making, using, selling and offering for sale, or contributing to the making, using, selling or offering for sale, or inducing others to make, use, sell or offer to sell products within the United States which contain, embody, and employ the invention(s) described and claimed in the '570 patent, constituted and, continues to constitute infringement of at least one claim of the '570 patent, as provided in 35 U.S.C. § 271.

47. As a direct and proximate result of the aforesaid infringement, ITW has been and will be greatly damaged and deprived from receiving, if such further infringement is not restrained by this Court, all the gains and profits to which ITW is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement by A+.

WHEREFORE, ITW prays for the following relief:

A. A finding that U.S. Patent Nos. 5,222,279, 5,926,928, D402,589, D397,641, D355,147 and D343,570 are being infringed by A+;



- B. An injunction permanently enjoining A+ and their officers, agents, subsidiaries, successors, servants and employees from further infringement of the patents;
- C. An accounting and award of damages adequate to compensate ITW for all acts of infringement by A+, but in no event less than a reasonable royalty for the use made of the infringed patents, together with prejudgment interest; and treble damages for willful infringement;
- D. That this case be declared exceptional and that ITW be awarded its attorneys fees pursuant to 35 U.S.C. § 285;
- E. That ITW be awarded its costs and expenses in this action; and
- F. That the Court grant ITW such other and further relief as it may deem proper.

**JURY DEMAND**

Plaintiff, ITW, hereby demands a trial by jury on all issues so triable.

Respectfully submitted,

Dated: August 15, 2005

By:

  
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Counsel for Plaintiff,  
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# Exhibit A



US005222279A

**United States Patent** [19][11] **Patent Number:** **5,222,279****Frano et al.**[45] **Date of Patent:** **Jun. 29, 1993**[54] **BUCKLE HAVING INCREASED HOLDING POWER WHEN UNDER LOAD**

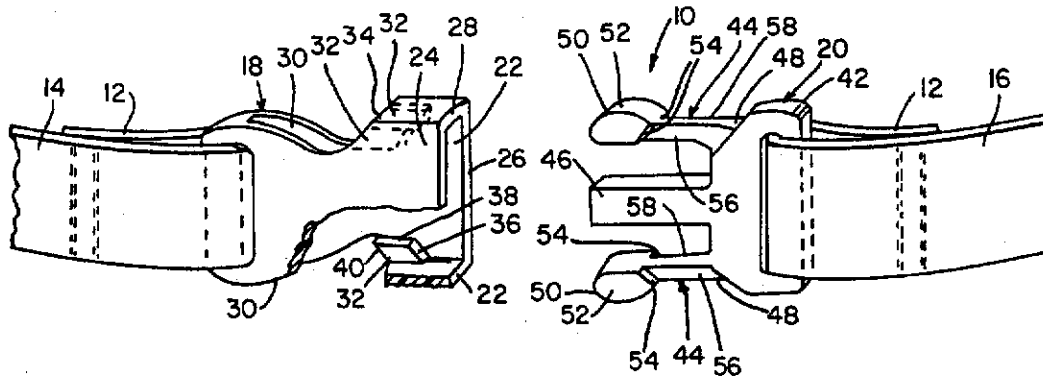
5,131,122 7/1992 Lavato ..... 24/616 X

[75] **Inventors:** Francis G. Frano, Hoffman Estates;  
Steven C. Keller, Island Lake, both of Ill.*Primary Examiner*—James R. Brittain  
*Attorney, Agent, or Firm*—Schwartz & Weinrieb[73] **Assignee:** Illinois Tool Works Inc., Glenview, Ill.[57] **ABSTRACT**[21] **Appl. No.:** 919,964

A buckle including a female receptacle member having a tubular body, an interior channel therethrough and being open to the channel on a portion of the tubular body, a male latch member having at least one arm member for insertion within the channel through the open end of the female receptacle member and a latch member formed between the tubular body and the arm member for releasable locking engagement of the tubular body and the arm member upon insertion of the arm member within the channel and for providing a resistance force in opposition to and alignment with an arm member removal loading force between the tubular body and the arm member.

[22] **Filed:** Jul. 27, 1992[51] **Int. Cl.<sup>5</sup>** ..... A44B 11/25[52] **U.S. Cl.** ..... 24/625[58] **Field of Search** ..... 24/614, 615, 616, 625[56] **References Cited****U.S. PATENT DOCUMENTS**

874,957 12/1907 Godley ..... 24/615  
4,662,040 5/1987 Terrell et al. .... 24/615 X  
4,672,725 6/1987 Kasai ..... 24/625  
4,831,694 5/1989 Kong ..... 24/615 X

**14 Claims, 1 Drawing Sheet**

U.S. Patent

June 29, 1993

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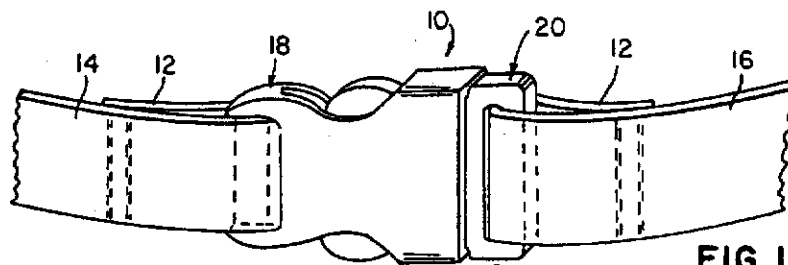


FIG. 1

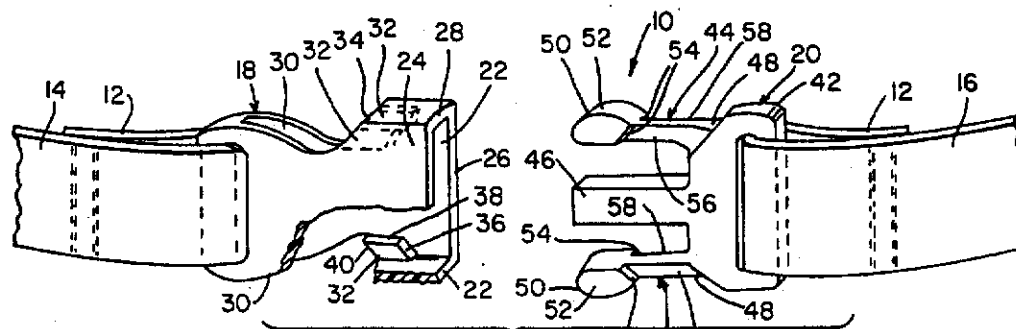


FIG. 2

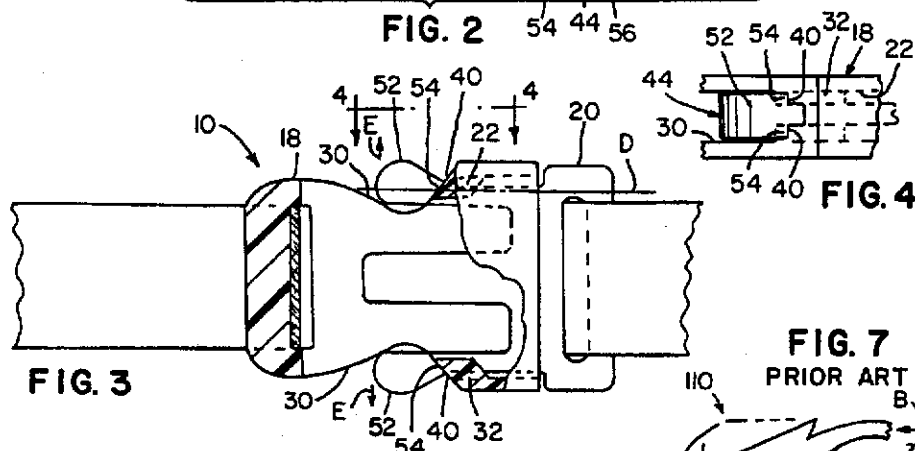


FIG. 3

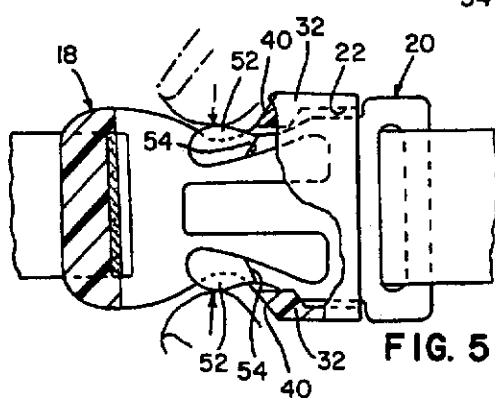


FIG. 4

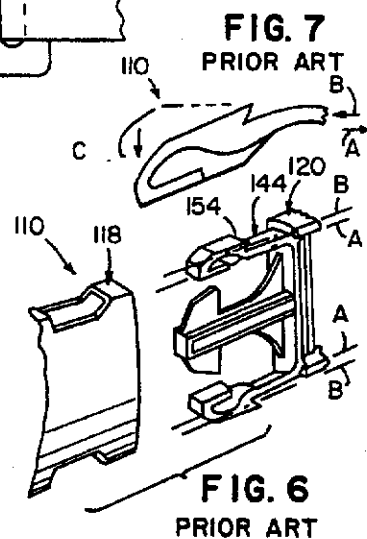


FIG. 6  
PRIOR ART

FIG. 7  
PRIOR ART

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## BUCKLE HAVING INCREASED HOLDING POWER WHEN UNDER LOAD

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to buckles, and more particularly to a releasable buckle having a female receptacle member and a corresponding male latch member which provides a latch resistance force in opposition to and alignment with a loading force acting to remove the male latch member to thereby increase the holding strength of the buckle.

#### 2. Description of the Related Art

Buckles typically include male and female connector members, one each connected to a free end of a strap, web belt or the like, to provide a connection between the two free ends of the straps. In order to connect the male and female members, the male member includes an engagement arm which is inserted within and releasably connected to the female connector member and can be engaged by a user to later disconnect the male and female connector members.

An example of such a buckle is disclosed in U.S. Pat. No. 4,150,464 which substantially is illustrated in FIGS. 6 and 7 and is assigned to the same assignee as the assignee herein. As FIGS. 6 and 7 illustrate, the female connector member includes apertures formed in opposite side walls for engagement with shoulders of corresponding latch arms formed with the male connector member. Since the shoulders, however, are positioned on the outside surfaces of the latch arms and engage the side walls of the female connector member, the buckle is susceptible to failure during loading. Specifically, the typical load in the latch arms which acts to remove the latch arms from the female connector member substantially is directed along the longitudinal axis or center line "A" of each latch arm. The line "A" is slightly offset from the line "B" which is the line upon which the latch resistance or engagement force substantially is directed between the side walls of the female connector member and the shoulders on the outside surfaces of the latch arms. Accordingly, as FIG. 7 illustrates, during loading a torque develops between the latch arms and the female connector member which tends to cause inward rotation of the latch arms in the direction of arrow "C" which causes failure of the latch arms and/or release of the buckle.

It therefore would be desirable to provide a buckle having male and female connector members where the male member is releasably retained within the female member and provides increased holding by aligning the resistance and loading forces between the male and female members.

### SUMMARY OF THE INVENTION

The invention provides a buckle including a female receptacle member having a tubular body, an interior channel therethrough and being open to the channel on a portion of the tubular body. A male latch member is included having at least one arm member for insertion within the channel through the open end of the female receptacle member. A latching member is provided between the tubular body and the arm member for releasable locking engagement of the tubular body and the arm member upon insertion of the arm member within the channel and for providing a resistance force in opposition to and alignment with an arm member

removal loading force between the tubular body and the arm member.

### BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features, and attendant advantages of the present invention will be more fully appreciated from the following detailed description, when considered in connection with the accompanying drawings, in which like reference characters designate like or corresponding parts throughout the several views, and wherein:

FIG. 1 is a perspective view of the buckle of the invention illustrated in a coupled condition and in conjunction with a pair of free ends of a belt or the like;

FIG. 2 is a perspective view, similar to FIG. 1, illustrating the buckle in its opened or uncoupled condition and with a portion of the female connector member broken away and another portion in dotted outline illustrating the interior engagement members thereof;

FIG. 3 is a top plan view of the buckle of the invention its coupled condition with a portion of the female connector member broken away illustrating the connection between the male and female connector members;

FIG. 4 is a side elevational view of the buckle of the invention taken along line 4-4 of FIG. 3 and in the direction indicated generally illustrating the engagement between the male and female connector members in detail;

FIG. 5 is a top plan view of the buckle of the invention, similar to FIG. 3, illustrating release of the male and female connector members;

FIG. 6 is a perspective exploded view of a prior art side release buckle member; and

FIG. 7 is an enlarged view of a portion of the prior art buckle of FIG. 6 illustrating the engagement and failure positions between the male and female connector members.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, a buckle of the invention is designated generally by the reference numeral 10. The buckle 10 typically is utilized to connect free ends 12 of webs or straps 14 and 16 and includes a female receptacle member 18 and a complementary male latch member 20.

The buckle 10 preferably is formed from plastic, but the particular material can vary. Additionally, the straps 14 and 16 preferably are connected by threading the free ends 12 through a portion of the female and male members 18 and 20, respectively, and then sewing the free ends 12 back onto the respective strap 14 and 16. Alternatively, the straps 14 and 16 can be connected in an adjustable manner (not illustrated.)

As FIG. 2 illustrates, the female receptacle member 18 preferably has a flat rectangular tubular cross-sectional configuration having a substantially rectangular shaped interior channel 22 defined by a first top surface or wall 24, a second opposite bottom surface or wall 26 and third and fourth opposite side walls 28. In order to provide the flat or rectangular shape to the female receptacle member 18, the top and bottom surfaces 24 and 26 are wider than the side walls 28.

As will be explained in detail below, the male latch member 20 is received and releasably retained within the channel 22 of the female receptacle member 18. To enable access and release of the male latch member 20

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from the exterior of the female receptacle member 18 by a user and assist in retaining the male latch member 20 within the female receptacle member 18, the female receptacle member 18 includes two apertures 30. Each aperture 30 extends at least through a portion of the top or bottom surfaces 24 and 26, and preferably extends through both the top and bottom surfaces 24 and 26 as well as through the opposite side walls 28 to form a side-release type buckle 10. It is to be understood, however, that the shape, location, position and number of apertures 30 can vary so long as the buckle 10 operates as described herein.

To guide the male latch member 20 as it is inserted into the channel 22 and retain the male latch member 20 therein, two pairs of engagement members 32 are positioned within the channel 22, one pair each on opposite sides of the channel 22. The engagement members 32 in each pair are formed with one engagement member 32 spanning the intersection of the side wall 28 and the top surface 24 and the other engagement member 32 spanning the intersection of the side wall 28 and the bottom surface 26. A gap 34 is provided between the engagement members 32 of each pair for accepting a portion of the male latch member 20 therebetween.

To guide and retain the male latch member 20, each engagement member 32 includes a first ramped surface 36, a second sliding surface 38 and a third locking surface 40. The third locking surface 40 of each engagement member 32 substantially is in alignment with one end of a respective aperture 30.

The male latch member 20 preferably includes a base portion 42 having two substantially flexible arm members 44 formed on opposite ends of the base portion 42 and extending outwardly away from one side of the base portion 42 a predetermined distance. If desired, to assist in insertion of the male latch member 20 within the channel 22, the male latch member 20 can include a guide arm 46 formed between the arm members 44 for complementary engagement with an alignment groove (not illustrated) formed within the channel 22 of the female receptacle member 18.

Each arm member 44 includes a first proximal end 48 connected to the base portion 42 and a second opposite distal end 50. To assist in sliding cooperation with the engagement members 32 and enable access to a user, the distal end 50 of each arm member 44 can include a rounded protrusion 52 on its outside surface. To releasably engage the arm members 44 within the female receptacle member 18, each arm member 44 preferably includes a shoulder 54 formed on both a top surface 56 and a bottom surface 58 of the arm members 44.

Preferably, to assist in engagement and prevent premature releasing of the male latch member 20 under load, the shoulders 54 are formed at an angle for cooperation with a complementary angle of the third locking surfaces 40 of the engagement members 32 as will be described in detail below.

To releasably connect the male latch member 20 to the female receptacle member 18, the second distal end 50 of each arm member 44 first is inserted within the channel 22. Upon continued insertion, the distal ends 50 will contact the first ramped surface 36 of each engagement member 32 and each arm member 44 will be flexed toward the interior of the channel 22. Further insertion provides for the protrusions 52 to ride along the second sliding surface 38 of each engagement member 32 until the protrusions 52 and the shoulder 54 clear the second sliding surface 38. At that point, each arm member 44

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snaps outward with respect to the channel 22 and, as FIGS. 3 and 4 illustrate, the shoulders 54 are seated against the third locking surface 40 of each engagement member 32 and the protrusions 52 extend outward through the apertures 30.

As FIG. 5 illustrates, to release the male latch member 20 from the channel 22, a user engages the protrusions 52 and exerts an inward pressure thereon to flex the arms 44 inward with respect to the channel 22. Once the shoulders 54 of the arm members 44 clear the locking surface 40 of the engagement members 32 the male latch member 20 can be removed from the channel 22.

As described earlier, the prior art buckle 110 illustrated in FIGS. 6 and 7 includes shoulders 154 located on the outside edges of the arm members 144 of the male latch member 120. Accordingly, the force provided under load is centered along line "A", which runs through the longitudinal center line or axis of each arm member 144, while the engagement or retaining force provided by the shoulders 154 is centered along line "B", which runs through the shoulders 154 and is slightly offset from the line "A". The offset between lines "A" and "B" produces a torque on the arm members 154 substantially in the direction of arrow "C" in FIG. 7 causing premature breakage of the arm members 144 and/or release of the buckle 110.

In contrast, as FIG. 3 illustrates, the buckle 10 of the present invention provides alignment along line "D" of both the load force through the longitudinal center line or axis of each arm member 44 and the engagement or retaining force provided by the shoulders 54. This alignment of forces is possible due to the positioning of the shoulders 54 along the top and bottom surfaces 56 and 58 of the arm members 44 and the cooperation with the third locking surfaces 40 of the engagement members 32.

Additionally, when a load separating force is applied to the buckle 10, the cooperation between the shoulders 54 and the third locking surfaces 40 actually cause the arm members 44 to be biased outwardly by virtue of the sliding relationship between the surfaces. More specifically, when a load separating force is applied to the buckle 10 along line "D" an outward force is provided in the direction of arrow "E" in FIG. 3 caused by the shoulders 54 moving slightly down the complementary third locking surfaces 40. The existence of this slight outward force provides increased holding power of the buckle 10 and prevents premature release.

Modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. A buckle, comprising:

a female receptacle member comprising a tubular body, an interior channel extending therethrough and open at one end thereof, and engagement means defined within said tubular body;

a male latch member having at least one arm member for insertion within said interior channel of said tubular body through said open end of said interior channel of said tubular body of said female receptacle member, said at least one arm member having a predetermined lateral width extending from a laterally outward position to a laterally inward position with respect to said interior channel of said tubular

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body, and a longitudinal axis extending longitudinally through said at least one arm member; and latch means disposed upon said at least one arm member for releasable locking engagement with said engagement means of said tubular body upon insertion of said at least one arm member within said interior channel of said tubular body, said latch means of said at least one arm member having a predetermined width, extending from a laterally outward position to a laterally inward position with respect to said interior channel of said tubular body, and a disposition upon said at least one arm member such that a longitudinal axis of said latch means coincides with said longitudinal axis of said at least one arm, as considered in said width direction, so as to provide a retaining force, acting along said longitudinal axis of said latch means, in opposition to and alignment with an arm member removal load force, as considered in said width direction, acting along said longitudinal axis of said at least one arm member.

2. The buckle as defined in claim 1 wherein said engagement means include an engagement member formed within said channel and said latch means comprises a shoulder formed proximate a distal end of said arm member, said engagement means providing inward deflection of said arm member with respect to said channel by said engagement member upon insertion of said arm member within said channel until said arm member clears said engagement member and flexes in a first direction toward the exterior of said channel to obtain a locked position, said shoulder being formed on a surface of said arm member, said surface facing a second direction substantially perpendicular to said first direction to provide said alignment of forces.

3. The buckle as defined in claim 2 including an aperture through said tubular body proximate said engagement member to provide access to said arm member from the exterior of said tubular body for release of said arm member from said engagement member.

4. The buckle as defined in claim 2, wherein: said engagement member and said latch shoulder are formed at cooperating complementary angles so as to provide increased holding power and prevent premature release of said buckle under load.

5. A buckle as set forth in claim 2, wherein: said engagement member of said engagement means including a ramped surface for providing said inward deflection of said at least one arm member upon insertion of said at least one arm member within said interior channel of said tubular body.

6. A buckle as set forth in claim 1, wherein: said at least one arm member comprises a pair of laterally spaced arm members.

7. A buckle as set forth in claim 1, further comprising: means defined upon both of said female receptacle and male latch members for securing ends of webs thereto whereby said ends of said webs are able to be connected together by said buckle.

8. A buckle, comprising: a female receptacle member comprising a substantially flat tubular body, having an interior channel extending therethrough, formed by two opposed top and bottom walls and two opposed side walls, said top and bottom walls being wider than said side walls, said tubular body having a predeter-

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mined length and being open to said channel on at least one end thereof;

a male latch member having at least one longitudinally extending and substantially flexible arm member for insertion into said interior channel of said female receptacle member through said open end of said female receptacle member, said at least one arm member having a predetermined lateral width extending from a laterally outward position to a laterally inward position with respect to said interior channel of said tubular body and in a direction extending between said side walls of said tubular body;

engagement means defined within said tubular body; and

latch means disposed upon said at least one arm member for releasable locking engagement with said engagement means of said tubular body, said latch means being accessible from the exterior of said tubular body for releasable engagement from said engagement means of said tubular body by a user, and said latch means comprising latch surfaces disposed upon opposite sides of said at least one arm member so as to extend toward both said top and bottom walls of said tubular body, said latch surfaces also having predetermined lateral width dimensions which correspond to said predetermined lateral width of said at least one arm member.

9. The buckle as defined in claim 8 wherein said engagement means include an engagement member formed with both of said top and bottom walls and said latch means of said arm member includes a pair of engagement shoulders, one each formed on opposite sides of said arm member for cooperative engagement with said engagement members of said top and bottom surfaces.

10. The buckle as defined in claim 9 including an aperture formed through said tubular body proximate at least one of said engagement members to provide access to said arm member from the exterior of said tubular body for release of said arm member from said engagement members.

11. The buckle as defined in claim 9 wherein said engagement members and said engagement shoulders are formed at cooperating complementary angles to provide increased holding power and prevent premature release of the buckle when under load.

12. A buckle as set forth in claim 8, wherein: said at least one arm member comprises a pair of laterally spaced arm members.

13. A buckle as set forth in claim 12, further comprising:

aperture means defined within both of said opposed side walls of said tubular body for providing access to said pair of laterally spaced arm members from the exterior of said tubular body so as to permit said pair of laterally spaced arm members to be released from said engagement means of said tubular body.

14. A buckle as set forth in claim 8, further comprising: means defined upon both of said female receptacle and male latch members for securing ends of webs thereto whereby said ends of said webs are able to be connected together by said buckle.

\* \* \* \* \*

# Exhibit B





US005926928A

**United States Patent** [19][11] **Patent Number:** **5,926,928****Lundstedt**[45] **Date of Patent:** **Jul. 27, 1999**[54] **VENTED SIDE RELEASE BUCKLE**

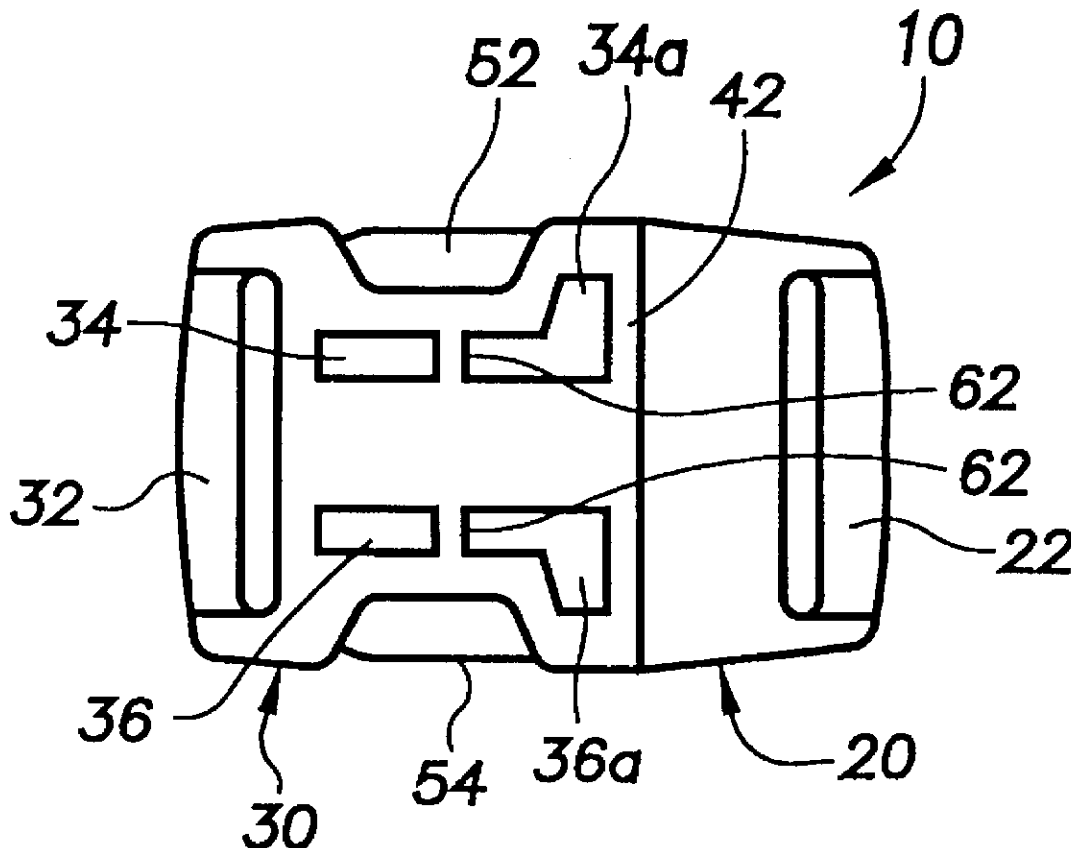
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[75] **Inventor:** **Kurt H. Lundstedt**, Hawthorne Woods, Ill.*Primary Examiner*—James R. Brittain*Assistant Examiner*—Robert J. Sandy*Attorney, Agent, or Firm*—Schwartz & Weinrieb[73] **Assignee:** **Illinois Tool Works Inc.**, Glenview, Ill.[57] **ABSTRACT**[21] **Appl. No.:** **09/039,700**[22] **Filed:** **Mar. 16, 1998**[51] **Int. Cl.<sup>6</sup>** ..... **A44B 11/25**[52] **U.S. Cl.** ..... **24/625; 24/615**[58] **Field of Search** ..... 24/614, 615, 616,  
24/625, 651

A side release buckle having a female member with a receptacle for receiving a tongue portion of a male member. One or more openings through the male member are alignable at least partially with corresponding openings through the female member when the tongue portion of the male member is disposed in the receptacle of the female member, whereby the at least partially aligned openings of the male and female members form corresponding apertures through the side release buckle. The openings may include one or more rib members for strength. The side release buckles have, among other advantages, reduced weight without compromising strength, and are suitable for applications where it is desirable to vent the buckle, or permit underlying fabric or structure to be at least partially visible therethrough, or to accept a locking member to prevent or deter casual release of the male and female members.

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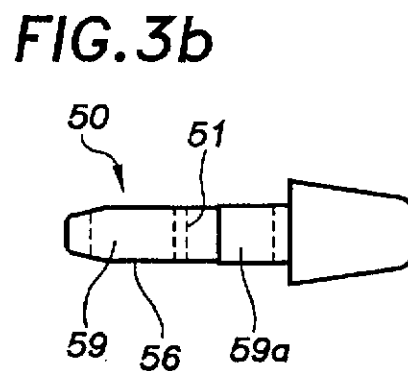
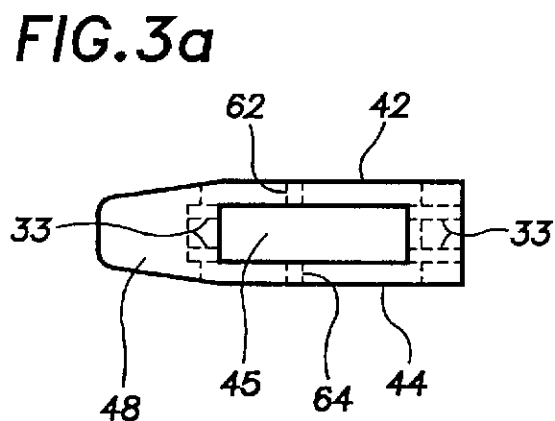
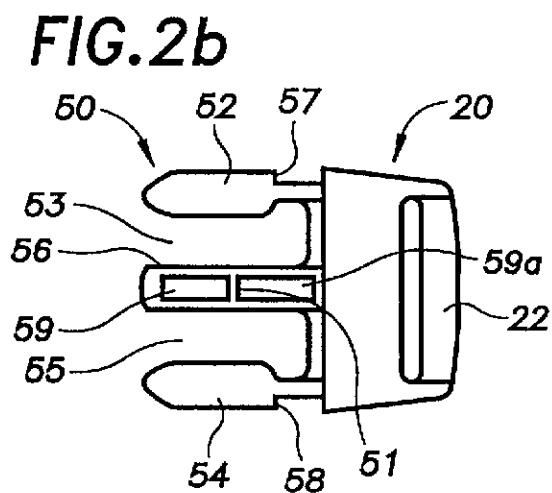
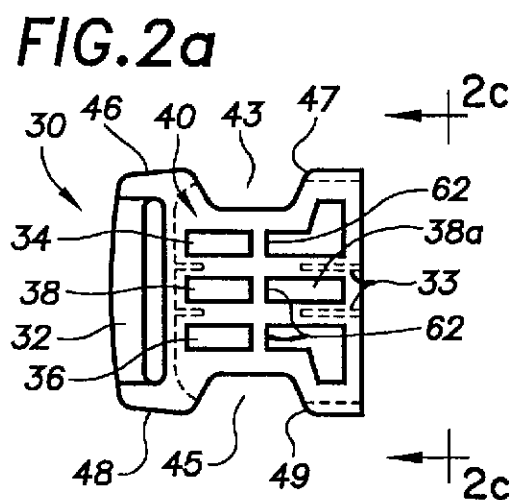
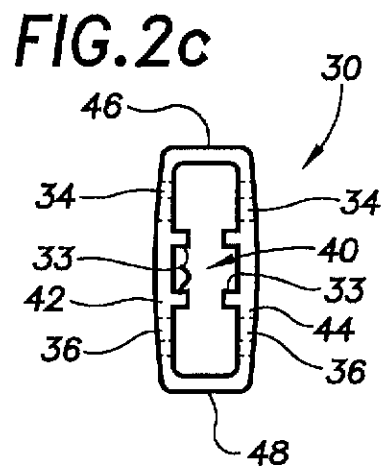
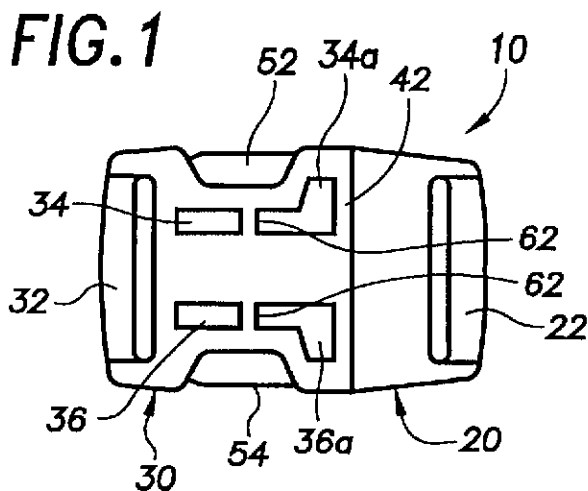
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**21 Claims, 1 Drawing Sheet**

## U.S. Patent

**Jul. 27, 1999**

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**VENTED SIDE RELEASE BUCKLE****FIELD OF THE INVENTION**

The present invention relates generally to buckles, and more particularly to side release buckles having releasably engageable male and female members.

**BACKGROUND OF THE INVENTION**

Releasably engageable side release buckle members are known generally and used widely for fastening one or more free ends of strap, or web, in an ever increasing range of applications including cargo and personnel restraints, personal floatation devices, and outerwear, among other applications.

U.S. Pat. No. 5,222,279, issued on Jun. 29, 1993, entitled "Buckle Having Increased Holding Power When Under Load" discloses a typical side release buckle having a female receptacle member with an interior channel for receiving resilient arms of a male latch member. The resilient arms include a shoulder or other portion cooperatively engageable with corresponding engagement surfaces of the female receptacle member when inserted into the channel thereof. The resilient arms of the male member are accessible through apertures in opposing sides of the female member, and the arms are flexible inwardly toward each other so as to disengage the shoulders thereof from the engagement surfaces of the female member, thereby releasing and separating the male and female members.

The present invention is drawn toward advancements in the art of buckle members, and more particularly to novel improvements in side release buckles.

**OBJECTS OF THE INVENTION**

It is an object of the invention to provide novel side release buckles that overcome problems in the prior art, and that are relatively economical to manufacture.

It is another object of the invention to provide novel side release buckles that are suitable for use in applications where it is desirable to vent the buckle, especially in outerwear applications including head gear and shoulder pack applications where the buckle contacts the user's skin or clothing, whereby the vented buckle eliminates or at least substantially reduces uncomfortable perspiratory moisture accumulation between the buckle and the user.

It is another object of the invention to provide novel side release buckles that will accept a shank or other locking member to prevent or at least deter casual opening of latchable male and female members thereof, and side release buckles that permit ready removal of debris that may become lodged in recesses thereof.

It is a further object of the invention to provide novel side release buckles that are relatively lightweight, and especially side release buckles that are lightweight without compromising strength.

It is yet another object of the invention to provide novel side release buckles that permit underlying fabric or structure to be at least partially visible therethrough, and for some applications it is an object of the present invention to provide novel side release buckles that have an appearance of lightweightness.

It is still another object of the invention to provide novel side release buckles that have reduced molding cycle times to increase manufacturing productivity.

It is a more particular object of the invention to provide novel side release buckles having a female member with a

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receptacle for receiving a tongue portion of a male member, wherein one or more openings of the male member are alignable at least partially with corresponding openings of the female member when the tongue portion of the male member is disposed in the receptacle of the female member, whereby the at least partially aligned openings of the male and female members form one or more corresponding apertures through the side release buckle.

It is another more particular object of the invention to provide novel side release buckles having a first rib member separating a first portion of an opening through a first side wall of the female member, and a second rib member separating a second portion of an opening through a second side wall of the female member, thereby providing at least one of the advantages above without compromising strength.

**BRIEF DESCRIPTION OF THE DRAWINGS**

These and other objects, aspects, features and advantages of the present invention will become more fully apparent upon careful consideration of the following Detailed Description of the Invention and the accompanying Drawings, which may be disproportionate for ease of understanding, wherein like structure and steps are referenced generally by corresponding numerals and indicators throughout the several views, and wherein:

FIG. 1 is a top plan view of a side release buckle according to an exemplary embodiment of the invention.

FIG. 2a is a top plan view of a side release buckle female member according to an alternative exemplary embodiment of the invention.

FIG. 2b is a top plan view of a side release buckle male member useable in combination with the exemplary embodiments of FIGS. 1 and 2a.

FIG. 2c is an end view along lines 2c-2c of FIG. 2a.

FIG. 3a is a side view of a side release buckle female member according to an exemplary embodiment of the invention.

FIG. 3b is a side view of a side release buckle male member according to the exemplary embodiment of FIG. 2b.

**DETAILED DESCRIPTION OF THE INVENTION**

FIG. 1 illustrates a side release buckle 10 according to an exemplary embodiment of the invention comprising generally a male member 20 releasably engageable with a female member 30. FIG. 2c illustrates the female member 30 having a receptacle 40 defined partially by first and second substantially opposing side walls 42 and 44 and substantially opposing end walls 46 and 48, also shown partially in FIG. 2a. FIG. 2b illustrates the male member 20 having a tongue portion 50 disposable in the receptacle 40 of the female member 30, as in FIG. 1. The male and female members 20 and 30 each have corresponding engagement surfaces that cooperate to form a releasable coupling as discussed further below. FIGS. 1, 2a and 2b illustrate the male and female members 20 and 30 including alternatively one or more corresponding strap engaging members 22 and 32, respectively, about which a free strap end, not shown, is disposed and retained as is known generally.

Generally, the male member 20 has at least one opening disposed through the tongue portion 50 thereof, and the female member 30 has at least one opening disposed through the substantially opposing side walls 42 and 44 thereof. The opening or openings in the male member 20 are alignable at

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least partially with corresponding openings in the female member 30 when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30 to form corresponding apertures that extend fully through the buckle 10, as shown in FIG. 1.

FIGS. 1, 2a and 2c illustrate first and second openings 34 and 36 disposed through the first and second substantially opposing side walls 42 and 44 of the female member 30. FIG. 2b illustrates the tongue portion 50 of male member 20 having first and second laterally disposed resilient arm members 52 and 54 separated by recesses 53 and 55, which permit inwardly flexing of the arm members 52 and 54 to engage the female member 30 as is known generally and discussed further in an exemplary embodiment below. FIG. 2b also illustrates the tongue portion 50 having a guide arm 56 disposed between and separated from the first and second laterally disposed arm members 52 and 54 by the first and second recesses 53 and 55. In alternative embodiments, the guide arm 56 is absent, and the recesses 53 and 55 form a common recess. The openings through the male member 20 are thus defined by the corresponding recesses 53 and 55, and in the absence of the guide arm 56, a single opening through the male member 20 is defined by a common recess between the arm member 52 and 54.

In the exemplary embodiment of FIG. 1, the openings 53 and 55 of the male member 20 are at least partially alignable with the openings 34 and 36, respectively, of the female member 30 when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30 to form corresponding apertures that extend fully through the buckle 10, as shown in FIG. 1. Alternatively, absent the guide arm 56 of the male member 20, the corresponding common recess, or opening, between the arm members 52 and 54 is alignable at least partially with the openings 34 and 36 of the female member when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member also forming corresponding apertures that extend through the buckle 10 shown in FIG. 1.

FIG. 2a illustrates an alternative embodiment wherein the female member 30 has a third or centrally located opening 38 therethrough in addition, or as an alternative, to the openings 34 and 36. And FIG. 2b illustrates the tongue portion 50 of male member 20 having a third opening 59 formed through the guide arm 56 in addition to the openings defined by recesses 53 and 55. According to this alternative configuration, the opening 59 of the male member 20 is at least partially alignable with the opening 38 of the female member 30 when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30 to form a corresponding aperture that extends through the buckle 10. Alternatively, absent the guide arm 56 of the male member 20, the corresponding common recess, or opening, between the arm members 52 and 54 is alignable at least partially with the opening 38 and or openings 34 and 36 of the female member 30 when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30 forming corresponding apertures that extend through the buckle 10.

FIGS. 1, 2a and 3a further illustrate corresponding first rib members 62 separating corresponding first portions of the openings 34, 36 and 38 disposed through the first side wall 42 of the female member 30, and FIG. 3a illustrates second rib members 64 separating a second portion of the openings 34, 36 and 38 disposed through the second side wall 44 of the female member 30, thereby forming corresponding opening portions 34a, 36a, and 38a in the first and second side walls 42 and 44 of the female member 30. The

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first rib members 62 in the first side wall 42 of the female member 30 are aligned with the second rib members 64 in the second side wall 44 of the female member 30 as shown in FIG. 3a.

The rib members increase the rigidity of the female member 30 and the buckle 10 generally, and are desirable for some applications, particularly applications having one or more elongated openings with end portions extending between the strap engaging members 22 and 32 as illustrated in FIGS. 1, 2a and 2b. In the exemplary embodiments, the rib members 62 are disposed transversely relative to the elongated dimension of the openings. Other embodiments may include more than one rib member in each opening, depending on the elongated dimension of the opening and strength requirements for a particular application, and in other applications one or more openings may not require any rib members.

The first and second openings 53 and 55 of the tongue portion 50 of the male member 20 generally do not require rib members since the resilient arm members 52 and 54 must be free to flex for coupling and releasing the male and female members 20 and 30 as discussed in an exemplary embodiment below. The third opening 59 in the male member 20 may include a rib member 51, thereby forming a corresponding opening portion 59a in the guide arm 56 of the male member 20, wherein the rib 51 is preferably aligned with any rib members 62 and 64 disposed in the corresponding opening portions 38 of the female member 30.

FIGS. 2a and 3a illustrate the first and second substantially opposing end walls 46 and 48 of the female member 30 having corresponding first and second end recesses or apertures 43 and 45 with engagement surfaces 47 and 49 cooperatively engagable with corresponding portions, or engagement surfaces, 57 and 58 of the first and second laterally disposed arms 52 and 54 of the male member 20, shown in FIG. 2b, to engagably couple the male and female members 20 and 30, as illustrated in FIG. 1. To release the engaged male and female members 20 and 30, the first and second laterally disposed arms 52 and 54 are flexed inwardly toward each other so as to disengage the engagement surfaces 57 and 58 of the male member 20 from the engagement surfaces 47 and 49 of the female member 30. Various alternative side release buckle engagement configurations are known generally and are useable alternatively to releasably couple the male and female members 20 and 30 of the buckle 10.

Thus according to the present invention, the male and female members 20 and 30 include one or more corresponding openings, which are alignable at least partially when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30. The one or more openings may be arranged symmetrically as illustrated in FIGS. 1, 2a and 2b. Alternatively, the openings may be arranged or located asymmetrically or otherwise as a particular application requires.

The male and female members 20 and 30 and the one or more openings thereof are formed preferably of a plastic material in a molding operation. In this mode of manufacture, the openings are formed by mold parts during molding, whereby the one or more openings advantageously facilitate relatively rapid cooling or setting of the molded members or articles, thereby reducing mold cycling time and increasing productivity. Alternatively, the one or more openings through the male and female members may be formed in drilling or milling operations after molding or fabrication.

The number, size, orientation, location and shape of the openings and rib members in the buckle member 10 is

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determined generally by the particular application requirements of the side release buckle. Buckles for applications which require reduced weight or air ventilation or exposure of underlying fabric or structure may have one or more relatively large openings with elongated ends disposed toward the strap engaging members 22 and 32, as shown in the exemplary embodiments of FIGS. 1, 2a and 2b, to maximize the flow of air through the apertures, or vents, of the side release buckle 10. The number, location and orientation of the rib members, if any, depends largely on the strength requirements of the buckle, and thus also depends on the number and size of the openings.

Buckles for applications where it is desirable to provide an opening for receiving a shank or locking member may require only one or more circular openings large enough to accept passage of the shank through the aperture of the side release buckle, and may be located and sized to provide relatively tight locking retention of the male and female members despite efforts to open the buckle. Such an opening may be located centrally through the female member 30 and through the guide arm 56 of the male member 20 to increase locking strength. Alternatively, plural openings may be located laterally along one or both side portions of the female member 30, for example openings 34 and 36 in FIG. 1. Circular openings or other shaped openings designated for accommodating a lock shank through the side release buckle may be used in combination with, or in addition to, larger openings for weight reduction or air ventilation or openings that permit visibility through the apertures extending through the side release buckle.

A lock shank disposed through an aperture of the side release buckle formed by the elongated central openings 38 and 59 in the female and male members 30 and 20 of FIGS. 2a and 2b will prevent opening of the buckle with or without rib members. A lock shank disposed through one of the laterally disposed elongated openings 34 and 36 in FIG. 1 will also prevent opening of the buckle by preventing or at least frustrating inwardly flexing of at least one of the arm members 52 or 54, which is generally necessary to release the male and female members 20 and 30.

FIGS. 2a, 2c and 3a illustrate the female member 30 having guiding members 33 disposed on opposing sides of the guide arm 56 when the tongue portion 50 of the male member 20 is disposed in the receptacle 40 of the female member 30, thereby aligning the male and female members 20 and 30 during assembly and coupling of the buckle 10 as is known generally. In the exemplary embodiment, the elongated openings 34, 36 and 38 in the female member 30 are located to accommodate the guiding members 33, which are desirable for many applications. Thus, depending on the application requirements, the number, size and location of the openings may depend also on the location of any guiding members 33.

While the foregoing written description of the invention enables one of ordinary skill in the art to make and use what is at present considered to be the best mode of the invention, it will be appreciated and understood by those of ordinary skill the existence of variations, combinations, modifications and equivalents within the spirit and scope of the specific exemplary embodiments disclosed herein. The present invention is therefore to be limited not by the specific exemplary embodiments disclosed herein but by all embodiments within the scope of the appended claims.

What is claimed is:

1. A side release buckle, comprising:

a male member having a longitudinally extending axis and a tongue portion;

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a female member having a longitudinally extending axis, a receptacle, defined partially by first and second substantially opposed side walls, for receiving said tongue portion of said male member, and latching means for releasably retaining said tongue portion of said male member within said receptacle;

an opening defined within and extending through a substantially axially central portion of said tongue portion of said male member so as to define upon said tongue portion of said male member a pair of laterally spaced, flexible latching arms for releasably engaging said latching means of said female member; and

a pair of separate openings laterally spaced from each other upon opposite sides of said longitudinally extending axis of said female member, respectively defined within and extending through each one of said first and second substantially opposed side walls of said female member, and having predetermined configurations for at least partial alignment with said opening of said male member when said tongue portion of said male member is disposed within said receptacle of said female member such that said at least partially aligned openings of said male and female members together form corresponding apertures which extend through said side release buckle and which have configurations which are substantially the same as said predetermined configurations of said pair of separate openings defined within said first and second substantially opposed side walls of said female member.

2. The side release buckle of claim 1, further comprising:

a first rib member provided upon said first side wall of said female member for separating a first one of said pair of openings defined within and extending through said first side wall of said female member into a pair of longitudinally spaced first openings; and

a second rib member provided upon said second side wall of said female member for separating a second one of said pair of openings defined within and extending through said second side wall of said female member into a pair of longitudinally spaced second openings.

3. The side release buckle of claim 2, wherein the first rib member of the first side wall of the female member is aligned with the second rib member of the second side wall of the female member.

4. The side release buckle of claim 2, wherein the first and second openings through the female member are elongated openings.

5. The side release buckle of claim 1, wherein:

said female member has first and second substantially opposed end walls further defining said receptacle; and first and second end apertures are defined within said first and second substantially opposed end walls of said female member for facilitating manipulation of said first and second laterally disposed latching arms of said male member when it is desired to releasably disengage said male member from said female member.

6. The side release buckle of claim 1, further comprising:

a male strap engagement member disposed upon said male member opposite said tongue portion of said male member; and

a female strap engagement member disposed upon said female member opposite said receptacle of said female member.

7. The side release buckle of claim 1, wherein:

said first and second laterally disposed arms of said male member have corresponding shoulder engagement portions; and

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said female member has first and second substantially opposed end walls further defining said receptacle and having corresponding first and second end aperture edge portions cooperatively engageable with said corresponding shoulder engagement portions of said first and second laterally disposed arms of said male member.

8. A side release buckle, comprising:

a male member having a longitudinally extending axis and a tongue portion;

a female member having a longitudinally extending axis, a receptacle, defined partially by first and second substantially opposed side walls, for receiving said tongue portion of said male member, and latching means for releasably retaining said tongue portion of said male member within said receptacle;

an opening defined within and extending through a substantially axially central portion of said tongue portion of said male member so as to define upon said tongue portion of said male member a pair of laterally spaced, flexible latching arms for releasably engaging said latching means of said female member, and an axially extending guide arm interposed between and separated from said pair of laterally spaced flexible, latching arms so as to divide said opening of said tongue portion of said male member into first and second laterally spaced openings within said tongue portion of said male member; and

first and second separate openings laterally spaced from each other upon opposite sides of said longitudinally extending axis of said female member and respectively defined within and extending through each one of said first and second substantially opposed side walls of said female member for at least partial alignment with said first and second openings of said male member when said tongue portion of said male member is disposed within said receptacle of said female member such that said at least partially aligned openings of said male and female members together form apertures through said side release buckle.

9. The side release buckle of claim 8, further comprising:

a first rib member provided upon said first side wall of said female member for separating said first opening defined within and extending through said first side wall of said female member into a pair of longitudinally spaced first openings; and

a second rib member provided upon said second side wall of said female member for separating said second opening defined within and extending through said second side wall of said female member into a pair of longitudinally spaced second openings.

10. The side release buckle of claim 9 wherein:

said first rib member of said first side wall of said female member is aligned with said second rib member of said second side wall of said female member.

11. The side release buckle of claim 9, wherein:

said pairs of first and second openings defined within said female member are elongated openings.

12. The side release buckle of claim 8 wherein:

said female member has first and second substantially opposed end walls further defining said receptacle; and

first and second end apertures are defined within said first and second substantially opposed end walls of said female member for facilitating manipulation of said first and second laterally disposed latching arms of said

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male member when it is desired to releasably disengage said male member from said female member.

13. The side release buckle of claim 8, further comprising:

a male strap engagement member disposed upon said male member opposite said tongue portion of said male member; and

a female strap engagement member disposed upon said female member opposite said receptacle of said female member.

14. The side release buckle of claim 8, wherein:

said first and second laterally disposed arms of said male member have corresponding shoulder engagement portions; and

said female member has first and second substantially opposed end walls further defining said receptacle and having corresponding first and second end aperture edge portions cooperatively engageable with said corresponding shoulder engagement portions of said first and second laterally disposed arms of said male member.

15. A side release buckle, comprising:

a male member having a longitudinally extending axis and a tongue portion;

a female member having a longitudinally extending axis, a receptacle, defined partially by first and second substantially opposed side walls, for receiving said tongue portion of said male member, and latching means for releasably retaining said tongue portion of said male member within said receptacle;

an opening defined within and extending through a substantially axially central portion of said tongue portion of said male member so as to define upon said tongue portion of said male member a pair of laterally spaced, flexible latching arms for releasably engaging said latching means of said female member;

an axially extending guide arm interposed between and separated from said pair of laterally spaced flexible, latching arms so as to divide said opening of said tongue portion of said male member into first and second laterally spaced openings within said tongue portion of said male member, and a third opening defined within said axially extending guide arm; and

first and second separate openings laterally spaced from each other upon opposite sides of said longitudinally extending axis of said female member and respectively defined within and extending through each one of said first and second substantially opposed side walls of said female member for at least partial alignment with said first and second openings of said male member when said tongue portion of said male member is disposed within said receptacle of said female member such that said at least partially aligned first and second openings of said male and female members together form first and second apertures through said side release buckle, and a third opening defined within and extending through said female member for at least partial alignment with said third opening of said guide arm of said male member when said tongue portion of said male member is disposed within said receptacle of said female member such that said at least partially aligned third openings of said male and female members together form a third aperture through said side release buckle.

16. The side release buckle of claim 15, further comprising:

a first rib member provided upon said first side wall of said female member for separating said first opening

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defined within and extending through said first side wall of said female member into a pair of longitudinally spaced first openings; and

a second rib member provided upon said second side wall of said female member for separating said second opening defined within and extending through said second side wall of said female member into a pair of longitudinally spaced second openings.

17. The side release buckle of claim 16, wherein:

said first rib member of said first side wall of said female member is aligned with said second rib member of said second side wall of said female member.

18. The side release buckle of claim 16, wherein:

said pairs of first and second openings defined within said female member are elongated openings.

19. The side release buckle of claim 15, wherein:

said female member has first and second substantially opposed end walls further defining said receptacle; and first and second end apertures are defined within said first and second substantially opposed end walls of said female member for facilitating manipulation of said first and second laterally disposed latching arms of said

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male member when it is desired to releasably disengage said male member from said female member.

20. The side release buckle of claim 15, further comprising:

a male strap engagement member disposed upon said male member opposite said tongue portion of said male member; and

a female strap engagement member disposed upon said female member opposite said receptacle of said female member.

21. The side release buckle of claim 15, wherein:

said first and second laterally disposed arms of said male member have corresponding shoulder engagement portions; and

said female member has first and second substantially opposed end walls further defining said receptacle and having corresponding first and second end aperture edge portions cooperatively engageable with said corresponding shoulder engagement portions of said first and second laterally disposed arms of said male member.

\* \* \* \* \*

# Exhibit C





US00D402589S

# United States Patent

[19] **Lundstedt**

[11] **Patent Number: Des. 402,589**[45] **Date of Patent: \*\*Dec. 15, 1998**[54] **BUCKLE MEMBER**

D. 386,125 11/1997 Anscher ..... D11/218

[75] **Inventor:** Kurt H. Lundstedt, Hawthorn Woods, Ill.*Primary Examiner*—Ralf Seifert[73] **Assignee:** Illinois Tool Works Inc., Glenview, Ill.[57] **CLAIM**[\*\*] **Term:** 14 Years

The ornamental design for a buckle member, as shown and described.

[21] **Appl. No.:** 85,075[22] **Filed:** Mar. 16, 1998[51] **LOC (6) Cl.** ..... 02-07[52] **U.S. Cl.** ..... D11/216[58] **Field of Search** ..... D11/200, 212,  
D11/215-218; 24/633 A, 631, 616, 200,  
197, 163 R, 196, 68 F; 297/467

## DESCRIPTION

FIG. 1 is a top perspective view of a buckle member according to a first embodiment of the invention;

FIG. 2 is a top plan view of the buckle member of FIG. 1, the bottom plan view being identical;

FIG. 3 is a top perspective view of a buckle member showing a second embodiment of my new design; and,

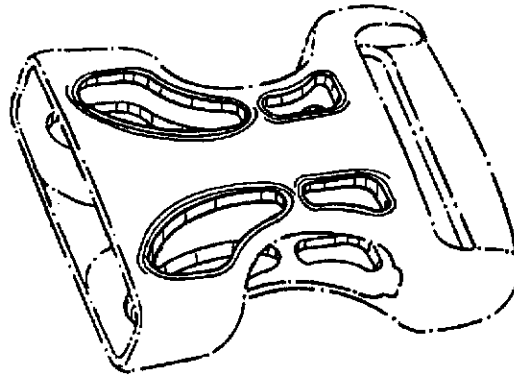
FIG. 4 is a top plan view of the buckle member of FIG. 3, the bottom plan view being identical.

The broken line portions of the figures are for illustrative purposes only and form no part of the claimed design.

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D. 341,105 11/1993 Louato ..... D11/218

**1 Claim, 2 Drawing Sheets**

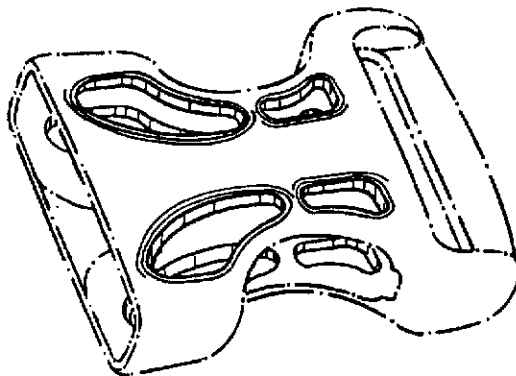
**U.S. Patent**

**Dec. 15, 1998**

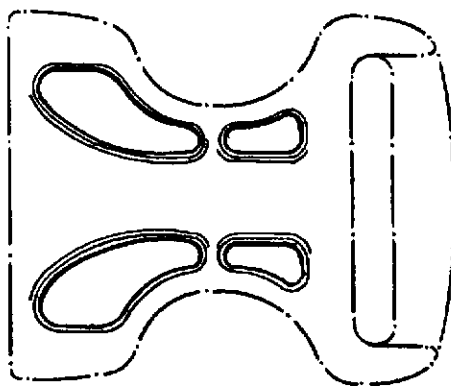
**Sheet 1 of 2**

**Des. 402,589**

*FIG. 1*



*FIG. 2*



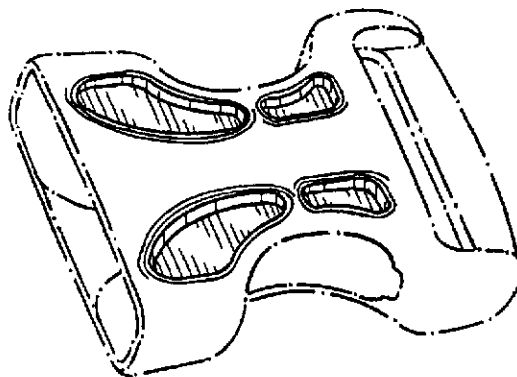
**U.S. Patent**

**Dec. 15, 1998**

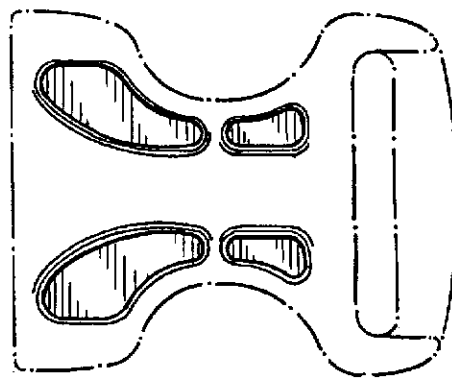
**Sheet 2 of 2**

**Des. 402,589**

*FIG. 3*



*FIG. 4*



# Exhibit D



US00D397641S

**United States Patent** [19]  
**Hamilton et al.**

[11] **Patent Number:** Des. 397,641  
 [45] **Date of Patent:** \*\*Sep. 1, 1998

[54] **ATTACHMENT ARMS OF A SLIDE RELEASE BUCKLE**

[75] **Inventors:** Jeffrey R. Hamilton, Hoffman Estates;  
 Steven C. Keller, Island Lake, both of Ill.

[73] **Assignee:** Illinois Tool Works Inc., Glenview, Ill.

[\*\*] **Term:** 14 Years

[21] **Appl. No.:** 71,607

[22] **Filed:** Jun. 3, 1997

[51] **LOC (6) CL** ..... 02-07

[52] **U.S. CL** ..... D11/216

[58] **Field of Search** ..... D11/200, 215-218;  
 24/196, 616, 625, 633 A

[56] **References Cited**

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D. 375,919	11/1996	Krauss	.....	D11/216
5,222,279	6/1993	Frano et al.	.....	24/625
5,507,076	4/1996	Anscher	.....	24/616

*Primary Examiner*—Ralf Seifert  
*Attorney, Agent, or Firm*—John P. O'Brien

[57] **CLAIM**

The ornamental design for attachment arms of a slide release buckle, as shown and described.

**DESCRIPTION**

FIG. 1 is a top perspective view of attachment arms of a side release buckle showing my new design, the broken line portion thereof is for illustrative purposes only and forms no part of the claimed design;

FIG. 2 is a side elevational view;

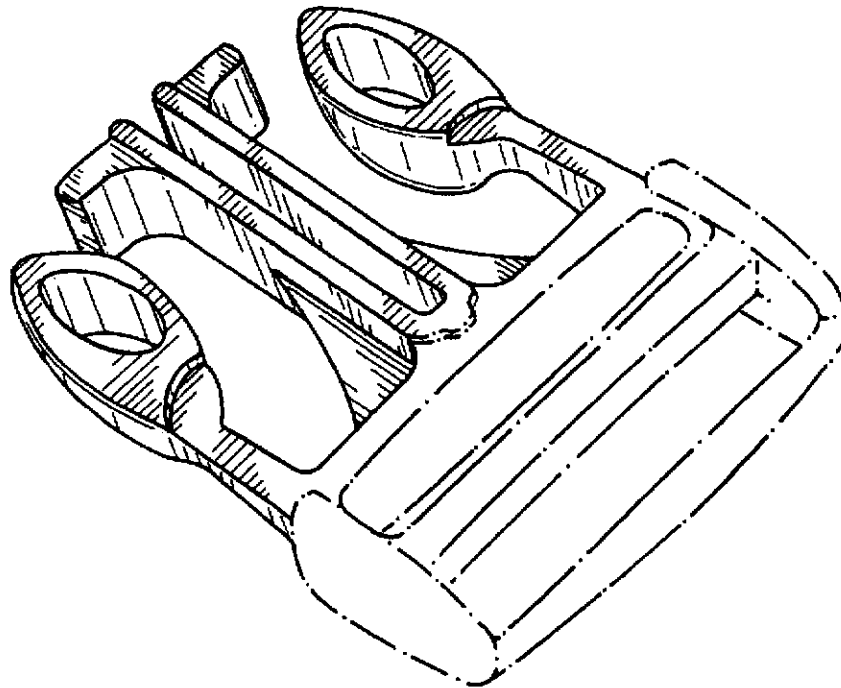
FIG. 3 is a front elevational view;

FIG. 4 is a top plan view, the opposite side view being identical; and,

FIG. 5 is a top perspective view of attachment arms of a side release buckle, the broken line showing of a female socket is for illustrative purposes only and forms no part of the claimed design.

The broken line showing of a corresponding female buckle, in FIGS. 1 through 5, is for illustrative purposes only and forms no part of the claimed design.

**1 Claim, 2 Drawing Sheets**

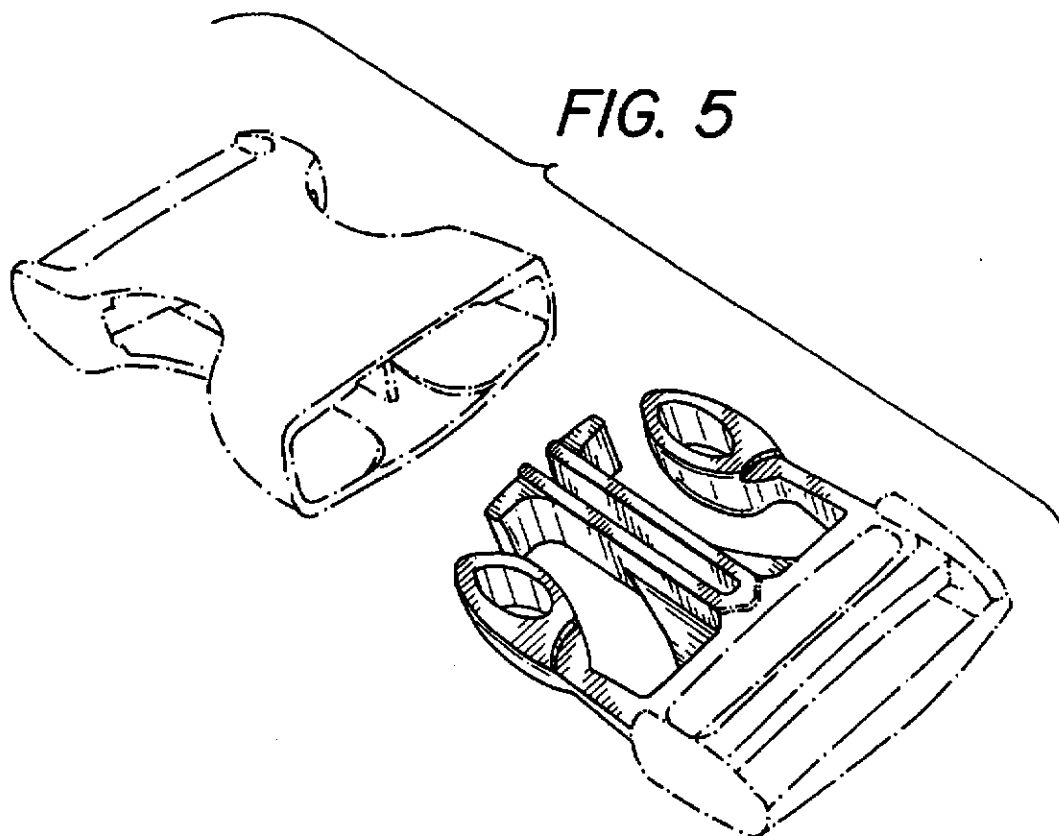
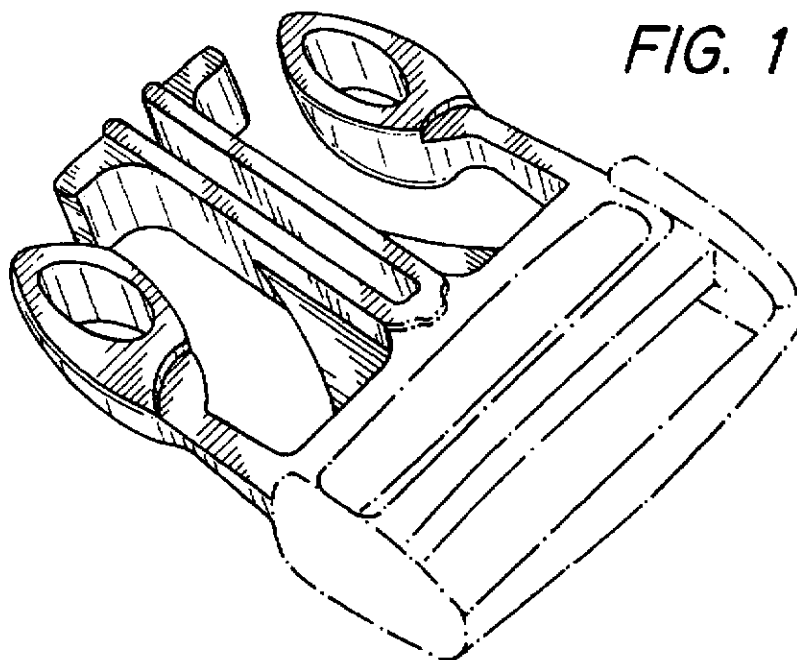


**U.S. Patent**

**Sep. 1, 1998**

**Sheet 1 of 2**

**Des. 397,641**



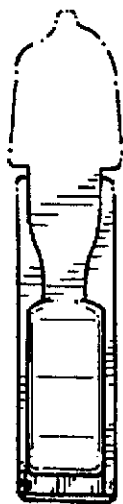
**U.S. Patent**

**Sep. 1, 1998**

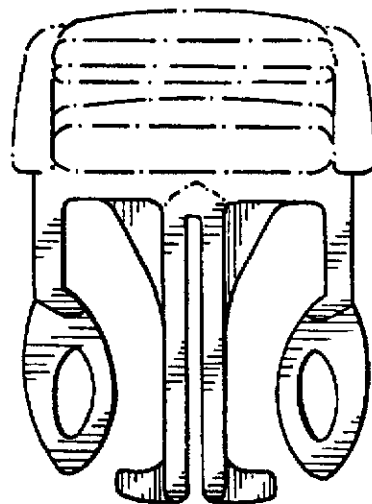
**Sheet 2 of 2**

**Des. 397,641**

*FIG. 2*



*FIG. 4*



*FIG. 3*



# Exhibit E





US00D355147S

**United States Patent** [19][11] **Patent Number:** **Des. 355,147****Frano**[45] **Date of Patent:** **\*\* Feb. 7, 1995**[54] **ZIPPER PULL**

4,602,405 7/1986 Sturman et al. .... 24/418

[75] **Inventor:** **Francis G. Frano, Hoffman Estates, Ill.**

4,704,770 11/1987 Minami et al. .... 24/431

4,896,404 1/1990 Garner ..... 24/415

[73] **Assignee:** **Illinois Tool Works Inc., Glenview, Ill.***Primary Examiner*—Ralf T. Seifert*Attorney, Agent, or Firm*—T. W. Buckman; J. P. O'Brien[\*\*] **Term:** **14 Years**[57] **CLAIM**[21] **Appl. No.:** **16,824**

The ornamental design for a zipper pull, as shown and described.

[22] **Filed:** **Dec. 27, 1993****DESCRIPTION**[52] **U.S. Cl.** ..... **D11/221**[58] **Field of Search** ..... **D11/200, 221; 24/381, 24/385, 415-417, 427-431; 70/456; 264/252**

FIG. 1 is a top, front left side perspective view of a zipper pull showing my new design, the broken line showing of a pair of cord ends is for illustrative purposes only and forms no part of the claimed design; FIG. 2 is a top, back, left side perspective view of FIG. 1;

[56] **References Cited****U.S. PATENT DOCUMENTS**

D. 303,511 9/1989 Minami ..... D11/221  
 D. 311,158 10/1990 Soule ..... D11/221  
 D. 320,367 10/1991 Kalbach ..... D11/221  
 D. 348,236 6/1994 James ..... D11/200  
 1,447,627 3/1923 Primoshic ..... 24/431  
 2,277,506 3/1942 Beckwith ..... 24/442  
 3,967,350 7/1976 Kawashima ..... 24/415

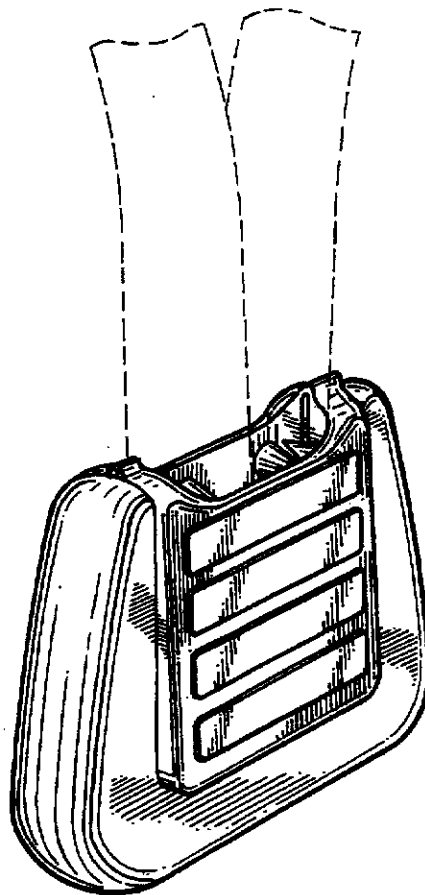
FIG. 3 is a top, plan, rear view of the zipper pull shown in the open position;

FIG. 4 is a front elevational view of FIG. 3;

FIG. 5 is a left side elevational view as viewed from the left side of FIG. 3;

FIG. 6 is a side elevational view of FIG. 3; and,

FIG. 7 is a bottom plan view of FIG. 3.

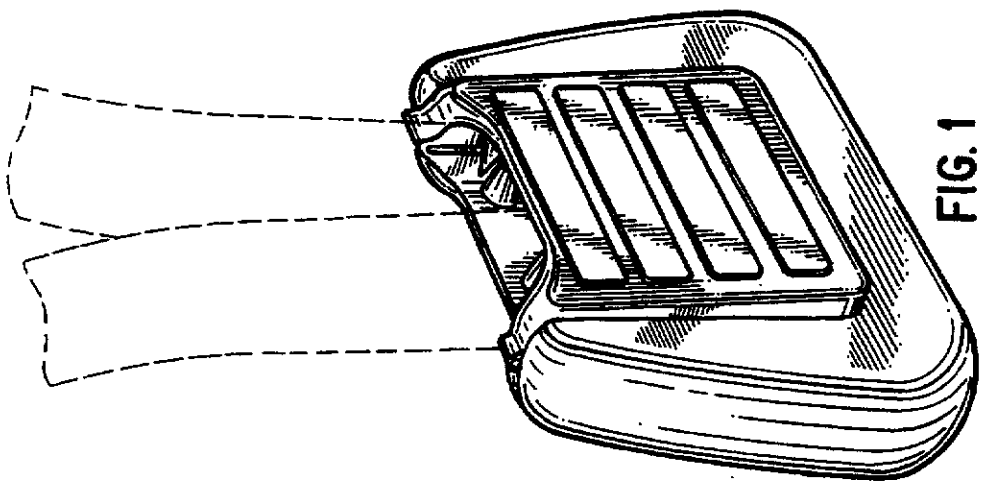
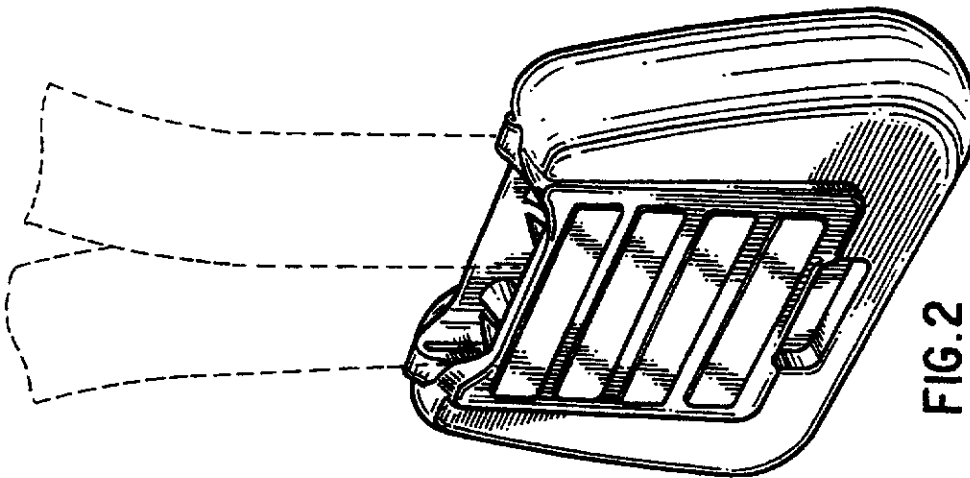


**U.S. Patent**

**Feb. 7, 1995**

**Sheet 1 of 3**

**Des. 355,147**



U.S. Patent

Feb. 7, 1995

Sheet 2 of 3

Des. 355,147

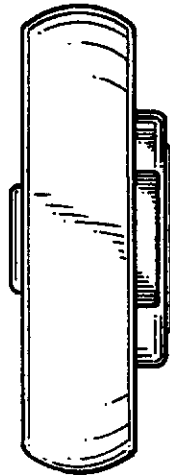


FIG. 5

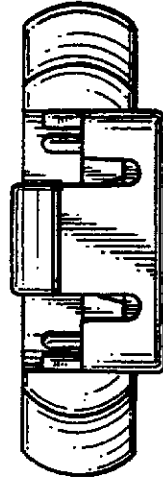


FIG. 6

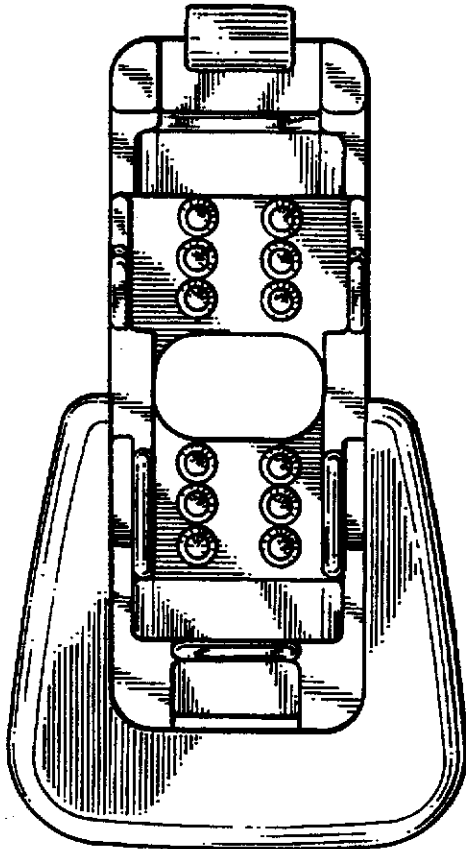


FIG. 3

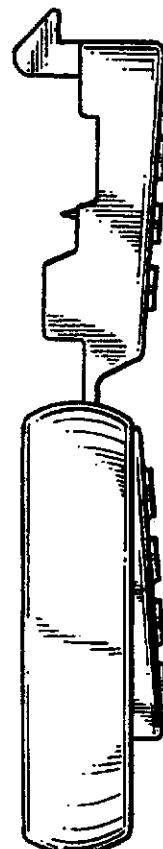


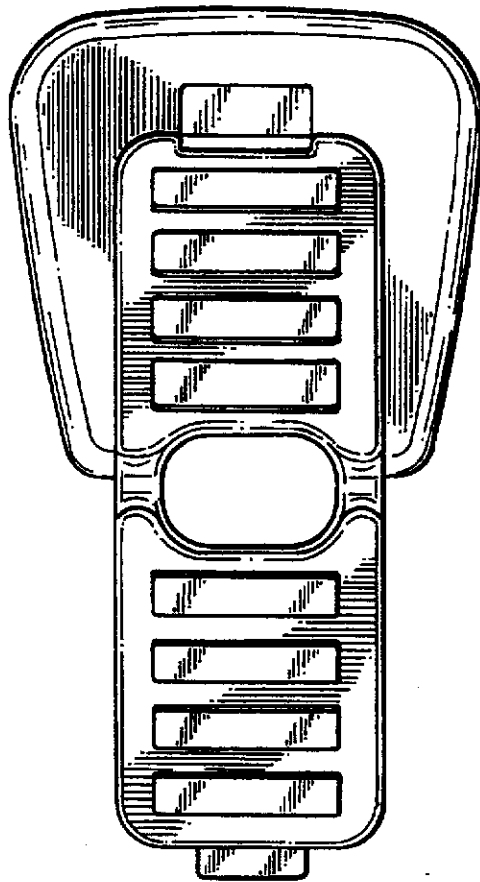
FIG. 4

**U.S. Patent**

**Feb. 7, 1995**

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**Des. 355,147**



**FIG. 7**

# Exhibit F



US00D343570S

**United States Patent** [19]

Meier

[11] Patent Number: **Des. 343,570**[45] Date of Patent: **\*\* Jan. 25, 1994**[54] **CORD LOCK**[75] Inventor: **Terrence P. Meier, Naperville, Ill.**[73] Assignee: **Illinois Tool Works Inc., Glenview, Ill.**[\*\*] Term: **14 Years**[21] Appl. No.: **938,644**[22] Filed: **Sep. 2, 1992**[52] U.S. Cl. .... **D8/383**[58] Field of Search ..... **D8/330-331, D8/333, 383, 356, 396; 24/115 R, 115 G, 115 M, 115 H, 115 K, 129 R**[56] **References Cited****U.S. PATENT DOCUMENTS**

D. 251,478	4/1979	Boden	.....	D8/383
D. 251,545	4/1979	Boden	.....	D8/383
D. 299,310	1/1989	Fildan	.....	D8/356
D. 310,166	8/1990	Fildan	.....	D8/383
3,266,464	8/1966	Davis	.....	24/115 H

4,453,292	6/1984	Bakker	.....	24/115
4,506,417	3/1985	Hara	.....	24/115
4,622,723	11/1986	Krauss	.....	24/115 G

*Primary Examiner*—Brian N. Vinson*Attorney, Agent, or Firm*—T. W. Buckman; J. P. O'Brien[57] **CLAIM**

The ornamental design for a cord lock, as shown and described.

**DESCRIPTION**

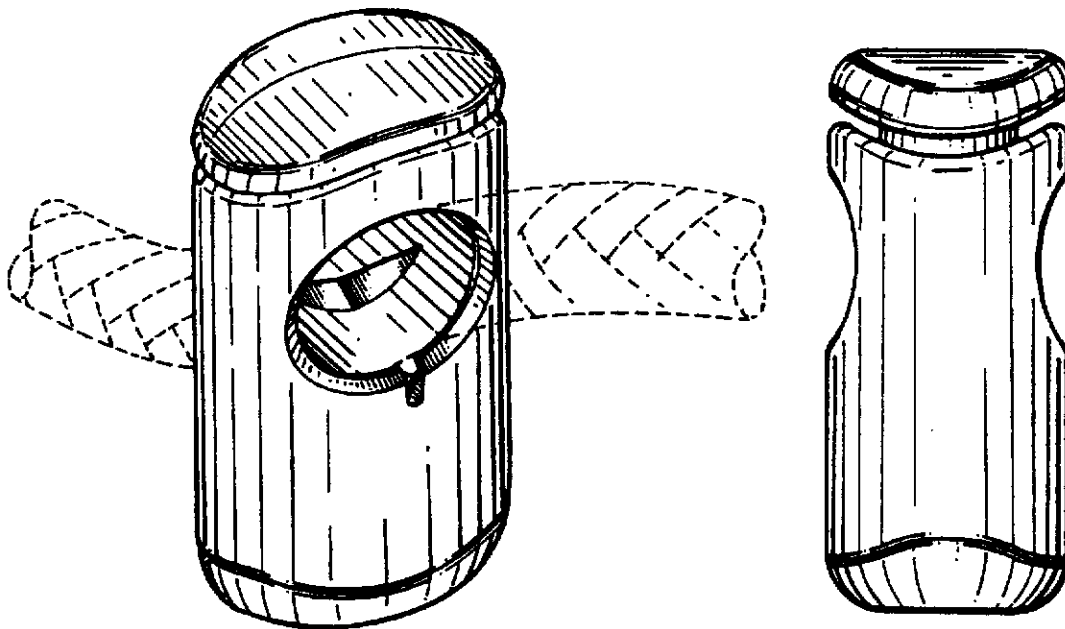
FIG. 1 is a top, front, and left side perspective view of a cord lock showing my new design, the fragmentary broken-line disclosure of a cord being for illustrative purposes only and forming no part of the claimed design;

FIG. 2 is a front elevational view thereof, the opposite side being identical;

FIG. 3 is a left end elevational view the opposite side being identical;

FIG. 4 is top plan view thereof; and,

FIG. 5 is a bottom plan view thereof.

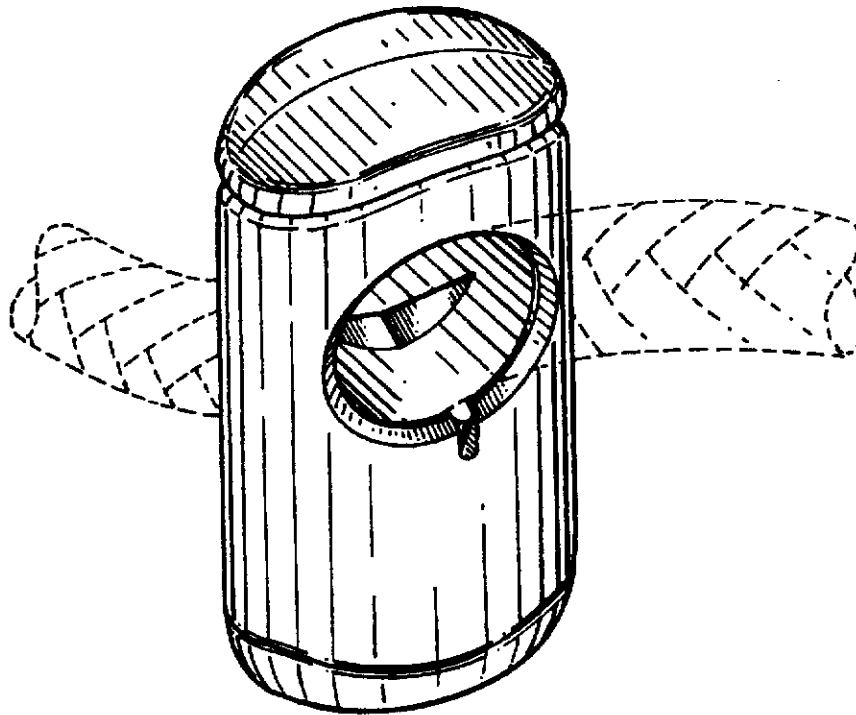


**U.S. Patent**

**Jan. 25, 1994**

**Sheet 1 of 3**

**Des. 343,570**



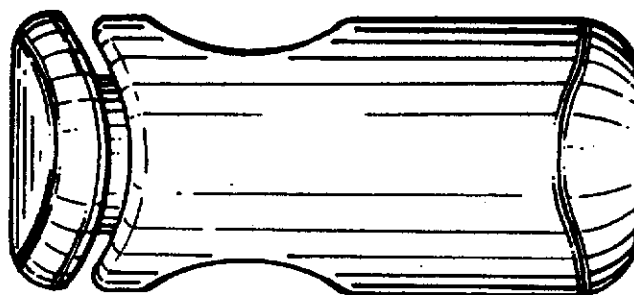
**FIG. 1**

**U.S. Patent**

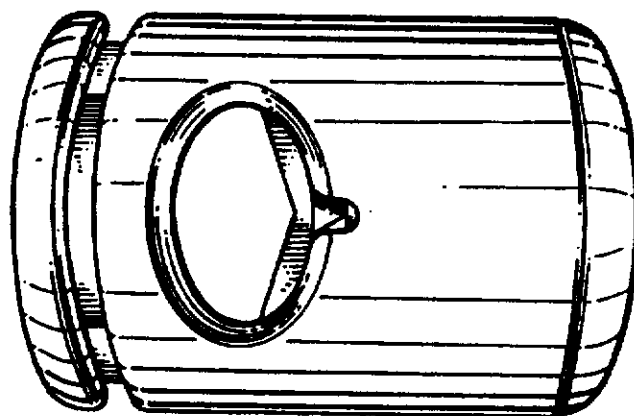
**Jan. 25, 1994**

**Sheet 2 of 3**

**Des. 343,570**



**FIG. 3**



**FIG. 2**

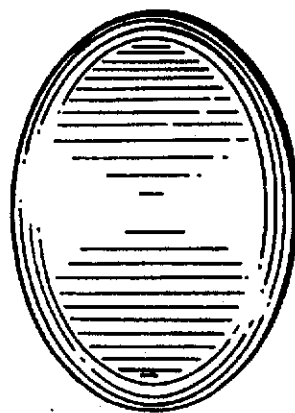


**U.S. Patent**

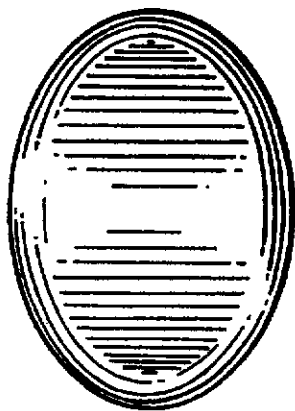
**Jan. 25, 1994**

**Sheet 3 of 3**

**Des. 343,570**



**FIG. 5**



**FIG. 4**